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**Young et al.**

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(54) **MOUNTING SYSTEMS FOR STRUCTURAL MEMBERS, FASTENING ASSEMBLIES THEREOF, AND VIBRATION ISOLATION SYSTEMS INCLUDING THE SAME**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

962,246 A \* 6/1910 Rockwell ..... F16F 9/43 267/64.28  
2,000,172 A \* 5/1935 Hanson ..... A47C 7/58 297/249

(Continued)

OTHER PUBLICATIONS

USPTO Office Action for U.S. Appl. No. 13/406,647 dated Sep. 19, 2013.

(Continued)

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(57) **ABSTRACT**

Mounting systems for structural members, fastening assemblies thereof, and vibration isolation systems including the same are provided. Mounting systems comprise a pair of mounting brackets, each clamped against a fastening assembly forming a mounting assembly. Fastening assemblies comprise a spherical rod end comprising a spherical member having a through opening and an integrally threaded shaft, first and second seating members on opposite sides of the spherical member and each having a through opening that is substantially coaxial with the spherical member through opening, and a partially threaded fastener that threadably engages each mounting bracket forming the mounting assembly. Structural members have axial end portions, each releasably coupled to a mounting bracket by the integrally threaded shaft. Axial end portions are threaded in opposite directions for permitting structural member rotation to adjust a length thereof to a substantially zero strain position. Structural members may be vibration isolator struts in vibration isolation systems.

**18 Claims, 7 Drawing Sheets**

